

## Claims

1. A system for controlling a plurality of devices, comprising:
  - a first computer comprising a first bus, a first signal processor and
  - a user interface for entering instructions and running an application
  - 5 program to receive data from each device, provide instructions to each
  - device and analyze the operation of each device, said first bus operating
  - at a first rate;
  - a second bus that operates had a second array different from said
  - first rate;
  - 10 a bus control logic unit controlling data flow by each device to the
  - second bus;
  - a second signal processor connected to read from and write data to
  - the first bus;
  - a gate array responsive to signals from said second signal
  - 15 processor for reading from and writing data to the second signal processor
  - and each bus control logic unit to control the operation of each device in
  - response to instructions generated from said first computer; and
  - a memory for storing data while either the first signal processor or
  - the second signal processor is performing operations on previous data in
  - 20 said memory.

2. The system described in claim 1, wherein:

each bus control logic unit comprises means for storing data for its respective device from said gate array while said second signal processor is unavailable for utilizing said data.

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3. The system described in claim 1, wherein:

said gate array waits for a bus control logic unit to signify that data has been completely read from or to the gate array and the second signal processor waits for said acknowledgement before providing data to  
10 or receiving data from said gate array.

4. The system described in claim 3, wherein:

said second signal processor stores data from said gate array in said memory for use by said first signal processor.

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5. The system described in claim 1, wherein:

each bus control logic unit comprises means for storing data control instructions from said gate array for its respective device while said second signal processor is unavailable for utilizing said data.

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6. The system described in claim 1, wherein:

said bus control logic unit provides a signal to say gate array to  
cause said first computer to identify than a bus connection with a device  
is defective.

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7. A method for controlling a plurality of devices, comprising:

running an application program on a first computer;

using a first data bus on said first computer for exchanging data  
between said first computer and a signal processor;

10 storing said data in a memory on said first bus for subsequent use  
by said signal processor;

exchanging data between said signal processor and a gate array;

exchanging gate array produced data with logic units, each  
controlling the exchange of data between a respective device and a bus

15 that operates as a different rate and different protocols than the first data  
bus; and

storing data produced by the devices with said logic devices until  
the gate array is available to use said data.

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8. The method described in claim 7, further comprising  
generating a signal from one of the logic units to indicate that a bus  
connection to its respective device is defective.

5 9. A system for controlling devices comprising:

first means for running an application program for a user interface  
to control the operation of the devices and manipulate data manifesting  
the operation of the devices;

a first data bus for exchanging data between said first means and a  
10 signal processor;

means connected to said first data bus for storing said data for  
subsequent use by said signal processor;

a local bus that connects the devices;

a gate array for exchanging data between said signal processor and  
15 the devices;

means associated with each device for controlling the exchange of  
data between said gate array and a device over said local bus and storing  
data for use by said gate array.

10. The system described in claim 9, wherein:

said means associated with each device comprises means for generating a signal that manifests that defective communication between the device and the local bus.

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11. A method for controlling devices, comprising:

running an application program for a user interface to control the operation of the devices and manipulate data manifesting the operation of the devices;

10 exchanging data between said first means and a first signal processor on a first data bus for;

storing said first data for subsequent use by said first signal processor;

connecting the devices over a local bus;

15 exchanging data between said signal processor and the devices using a second signal processor; and

controlling the exchange of data between said second signal processor and each device over said local bus and storing data on said local bus for use by said second signal processor.

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12. The method described in claim 11, wherein the second signal processor comprises a gate array.

11. The method described in claim 10, wherein the second signal processor comprises a gate array.